SUMMARY

The incident occurred during a regular flight from Malmö Airport to Bromma Airport.

At pre-flight inspection a damage was detected on the left hand airflow sensor. The sensor was replaced before the flight.

The take-off was normal until lift off, when the stick shaker was activated. However, the flight crew quickly identified the warning as false.

A warning was indicated on the instrument panel, (IDNT 1). The commander pressed the IDNT/INHIB 1 button and the INHIB part of the button lit up, but felt that nothing happened.

Later during the climb, when they got into clouds at 660 feet above the ground the stick push was activated, which means that the control column is pushed forward.

By following the emergency checklists, the systems could be shut down which solved the problems. Thereafter a normal landing was performed.

An examination of the left hand airflow sensor showed that the unit was incorrectly assembled and that it was 45–50 degrees out of the specification for all angle readings.

To get a stick shake it is sufficient for one sensor to indicate a high angle of attack. In order for the stick push to be activated, one sensor must have a high angle of attack and the other must have a high angle or a high rate of change.

The most likely explanation for stick push activation is that the turbulence caused the change rate of the serviceable airflow sensor to become large enough.

In the absence of tampering or warranty seals, it is impossible to determine if the device has been delivered incorrectly or if someone has manipulated it at a later stage.

The airflow sensor consists of two parts, the vane and the electronic unit. The vane can be replaced separately, but in this case the complete unit was replaced.

After the replacement of the airflow sensor a simple test intended for vane replacement was performed, which meant that the fault on the sensor was not detected.

The serious incident was caused by the mix up of test instructions for installation of “Vane assembly” and “Airflow sensor” which led to a prescribed functional test was not performed and the fault in the airflow sensor was not detected.

Contributing factors:

- The different component names Vane assembly and Airflow sensor enhance the risk of confusion between tasks.

- The interruptions during the change of the airflow sensor were a stress factor which increased the risk of mistakes.
- Re-inspection after replacement of airflow sensor was not performed.

SAFETY RECOMMENDATIONS

FAA is recommended to:

- Encourage that components that require specially approved maintenance facilities are sealed to detect unauthorized manipulation. *(RL 2017:08 R1)*

EASA is recommended to:

- Encourage that components that require specially approved maintenance facilities are sealed to detect unauthorized manipulation. *(RL 2017:08 R2)*